



## **Study of the Effectiveness of the Virginia Standards of Learning (SOL) Reforms**

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# Study of the Effectiveness of the Virginia Standards of Learning (SOL) Reforms

In November 2000, the Virginia Department of Education's Technical Advisory Committee (TAC) recommended the initiation of a series of studies to assess the effectiveness of the Standards of Learning Program (SOL) "to provide information that will be useful in continuing to modify and to improve the SOL Program so that it can achieve its many purposes." The first of those studies, the TAC thought, could be initiated using currently available data.

The TAC identified several questions to be answered by the data. This study commissioned in July 2002 answers those questions and more as it:

1. Looks at the impacts of the Standards of Learning reforms since its inception using as broad a range of data indicators as available,
2. Suggests next steps needed in order to more fully substantiate the effectiveness of the Standards of Learning, the influence of the Standards of Learning on a range of stakeholders, and as such, ways in which the state's efforts can be extended to get more schools performing at higher levels, and
3. Proposes needed changes in the state's collection, storage and analysis of data that would be required to further track the impact of the state's efforts, and to respond to the requirements of *No Child Left Behind*.

## Background

Virginia crafted a four-step education reform program, to be implemented over several years, to address both student achievement and system accountability:

**Step 1:** Virginia developed statewide content rich, grade-by-grade, academic standards (Standards of Learning or SOLs) that defined what teachers had to teach and what students were expected to learn. Local school divisions were advised that they needed to align their local curricula with the new state academic standards. (June 1995)

**Step 2:** To ensure that local school personnel would really focus on the new academic standards, the state of Virginia designed a set of annual criterion-referenced tests aligned specifically to Virginia's SOLs that would assess the extent to which students mastered the state academic standards. (Spring 1998) The tests are given in Grades 3, 5, 8. In addition, there are a series of SOL *end-of-course* assessments given at the end of certain high school courses.

**Step 3:** To ensure that all local educational personnel understood that s/he was responsible for doing whatever necessary to ensure that students master the standards, the state designed an accreditation system that required schools to show adequate performance on the standards-related tests to earn state accreditation. Standards of Accreditation are known in the state as SOAs. (June 2000)

Each one of Virginia's public schools is assigned a rating annually based in large part on the extent to which they meet the performance benchmarks, i.e., pass rates of their students on the SOL assessments in the core areas. These benchmarks increase

each year using a “stair step” approach. To be rated *Fully Accredited*, the schools must meet a 70 percent pass rate in all core areas.

Graduation requirements are set to go into effect for the graduating class of 2004, with every student required to pass six SOL tests to earn a Standard Diploma: two in English and four others of their choosing. Beginning with the graduating class of 2007, to earn a Standard Diploma a student must pass two SOLs in English, one in mathematics, one in science, one in history and one of their choosing. For Grades K-8, any student who does not pass any of the SOL assessments in Grades 3, 5, and 8 is required to attend a summer school program or to participate in another form of remediation. (If a student fails to pass one SOL assessment, the school may require that student to attend a remediation program.)

**Step 4:** To add *teeth* to this system of standards-tests-accreditation, the state required the results of all tests and accreditation levels (along with other indicators) to be made public annually in the School Performance Report Card.

While the full force of this program won’t take effect until the graduating class of 2004 (and school accreditation requirements won’t take final effect until 2007) the State of Virginia decided in 2002, to study the effectiveness (up to this juncture) of the accountability process. One goal of the study is to suggest ways in which the process may be fine-tuned in the future. (Coincidentally, the *No Child Left Behind* requirements made the timing of this study even more important.)

## Section I

### Executive Summary/Findings

Prior to the introduction of the SOL four-step reform process (1993 to 1995):

- Performance on Iowa Test of Basic Skills (ITBS), Literacy Passport Test (LPT), Scholastic Aptitude Test-I (SAT-I), and National Assessment of Educational Progress (NAEP) were relatively stagnant, with NAEP performance in reading taking a precipitous decline in 1994.

Since the initial phase-in of the four-step SOL reforms (1996 to 2002):

- The percent of students *not meeting* the state standard (the lowest performance level) meaningfully declined on the SOL assessments in Grades 3, 5, and 8. Accordingly, there was significant success moving students to “proficient” in both reading and math. The increase in achievement was noteworthy at the high school level, as well, as shown by the “pass” rates on the *end-of-course* tests.
- On SOL tests at Grades 3 and 5 and on SOL high school *end-of-course* tests, there were meaningful improvements for each ethnic group’s performance since the introduction of SOL reforms. The only modest or slightly negative trend was in Grade 8.
- Evidence of improvement on NAEP and SAT-I tests since the introduction of the SOL reforms suggests that the gains on the SOL assessments are valid indicators of improvement in learning. There is some ambiguity regarding a comparison of SOL and SAT-9 test results, however. The modest gains in SAT-9 at Grade 9 suggest that more attention should be applied here.
- There is evidence of other positive practices since the introduction of the SOL reforms, including gains in the number of Advanced Placement candidates and exams, increased enrollments in International Baccalaureate and moderate gains in the percent of students preparing to attend college.
- No indication exists that SOL scores are being inflated as a result of excluding low-performing students from testing although test absences in 2002 are up somewhat from their 1998 levels in both reading and math. No evidence exists that more students are failing to graduate from high school as a result of the SOLs either. There is a need for closer study into the types of diplomas Virginia’s students are earning, however, as the number of Standard Diplomas now outnumber Advanced Diplomas and the percent of Special Diplomas awarded – although a small percent of the total diplomas awarded – has doubled since 1997.
- The number of Virginia’s schools that are *Provisionally* or *Fully Accredited* has grown steadily since the inception of the current SOAs.
- The vast majority of Virginia’s divisions have participated in the steady, positive progress of the state as measured by achievement on the SOL tests. There are, however, some divisions in which there have been little or no improvement. There are also a few divisions in which there have been actual declines since 1998.

The next two sections of this study provide analysis: Section II reviews academic results prior to the introduction of the SOLs; Section III reviews academic results since the introduction of the SOLs. The study is framed around *eight* questions that could be answered with existing data:

1. What were the statewide trends in student achievement in the years prior to the implementation of Virginia’s SOL reforms?
2. What are the statewide trends in student achievement since the implementation of the SOL reforms, as measured by the SOL tests?

3. To what extent are major ethnic groups participating in the improved SOL test scores?
4. What are the trends in student achievement on other statewide achievement tests that are not part of the state accountability system, and how do they compare with the trends on the SOL?
5. To what extent has Virginia seen an increase in positive practices following the implementation of the SOL reforms, including more students succeeding in rigorous curricula or preparing to attend college?
6. Is there any evidence of negative practices resulting from efforts to improve SOL test scores, including a rise in student absences from tests or dropout rates?
7. Has the percent of *Fully Accredited* and *Provisionally Accredited (Meets State Standards)* schools increased or decreased?
8. In spite of the overall statewide progress on the SOL assessments, are there divisions that have not kept pace?

For each question there is an introduction as to *why* we asked the question, a succinct statement of the findings, and finally, an analysis through text, charts, and graphs.

The final section offers recommendations for next steps.

## Section II

### Academic Performance Prior to the Implementation of the SOL Reforms

**QUESTION: What were the statewide trends in student achievement in the years prior to the implementation of Virginia's SOL reforms?**

What this level of inquiry tells us: In order to know whether the SOL reforms are operating as expected by encouraging schools to accelerate improvements in student achievement, we need to know whether and to what degree student achievement was increasing, decreasing, or was flat in the several years preceding their implementation.

**Findings:** In the years preceding the SOL reforms academic performance was stagnant in most cases, and actually declined in others. The National Assessment of Education Progress (NAEP) indicated that mathematics performance was relatively flat, and in reading there was a statistically significant decline in performance. (Table 1)

Additional evidence that there was little or no statewide academic progress prior to the introduction of the SOL reforms can be found in Table 2, which provides ITBS norm-referenced test results, Table 3 which presents Literacy Passport Test results, and Table 4 which presents SAT-I (college admission test) results for the years prior to the SOL reforms. These same data are also presented in bar graphs.

#### **National Assessment of Educational Progress (NAEP) Results**

**Mathematics:** In a four year period prior to the full implementation of the SOL reforms there was a modest increase (three points) in the percent of Grade 4 students scoring at the *basic* level of achievement in mathematics while performance at the *proficient* and *advanced* levels remained static. During the same period of time performance of Grade 8 students remained virtually the same, as shown in Table 1 and the corresponding graphs. The average score of Virginia's students remained about the same as the national average in the two years in both grades.

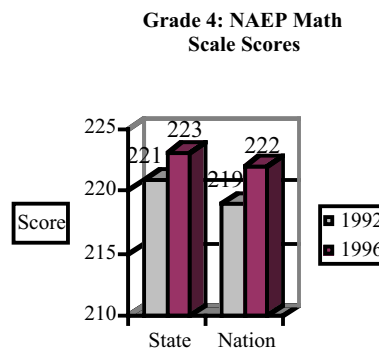
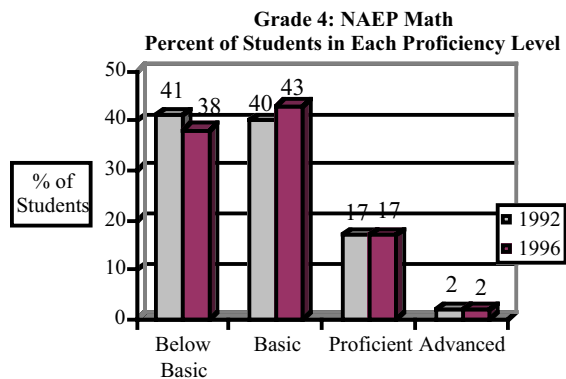
**Reading:** In 1994, Virginia suffered a vast decline – one of the largest in the nation – in reading performance. The percent of students scoring *below basic* – the lowest NAEP achievement level – increased 10 percentage points from 1992 to 1994 (prior to the introduction of the SOL reforms). There was also a significant decline (six percentage points) in the percent of students scoring at the *proficient* level. Moreover, Virginia's scale score dropped eight points in just two years, from well above the national average to just about at the national average.



**Table 1 (and corresponding graphs): NAEP Results – Mathematics and Reading: Percent In Proficiency Levels**

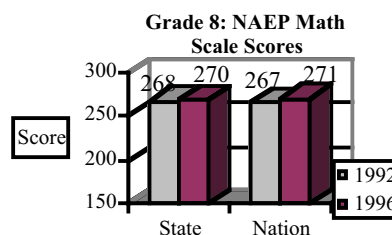
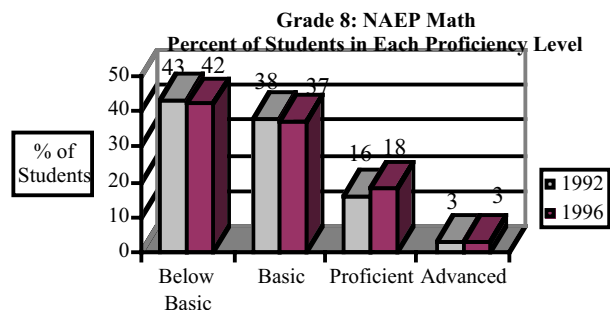
**NAEP Mathematics – Grade 4**

Year	Below Basic	Basic	Proficient	Advanced	Scale Score	
					State	Nation
1992	41	40	17	2	221	219
1996	38	43	17	2	223	222



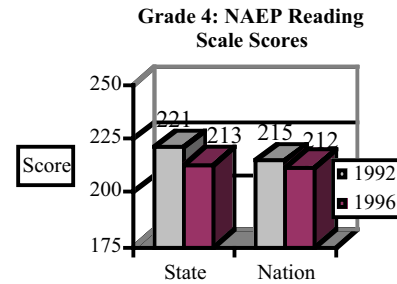
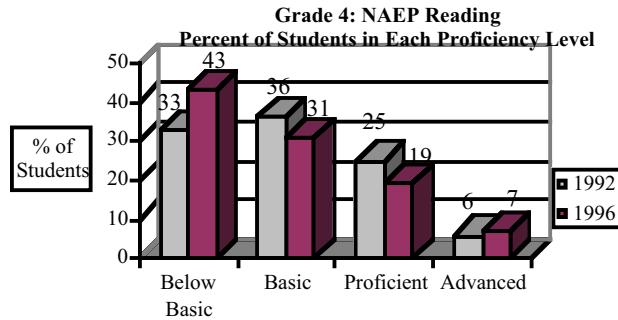
**NAEP Mathematics – Grade 8**

Year	Below Basic	Basic	Proficient	Advanced	Scale Score	
					State	Nation
1992	43	38	16	3	268	267
1996	42	37	18	3	270	271



### NAEP Reading– Grade 4

Year	Below Basic	Basic	Proficient	Advanced	Scale Score	
					State	Nation
1992	33	36	25	6	221	215
1994	43	31	19	7	213	212

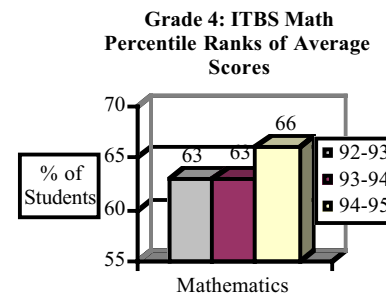
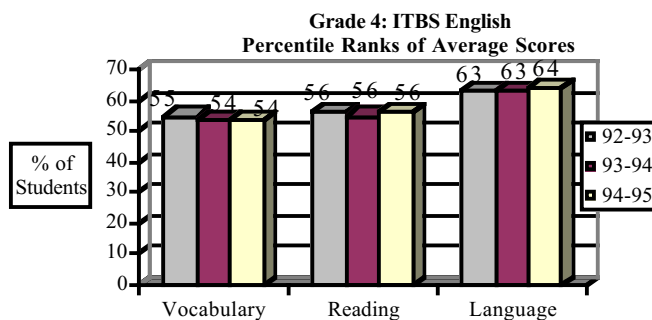


### ITBS Results

The results of the ITBS indicate that (statewide) performance was relatively flat in all three grades tested in all subject areas tested from 1993-95 prior to the implementation of the SOL reforms. The only exception was in Grade 4 mathematics (three point increase). (Table 2)

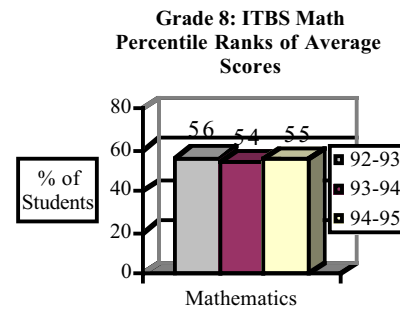
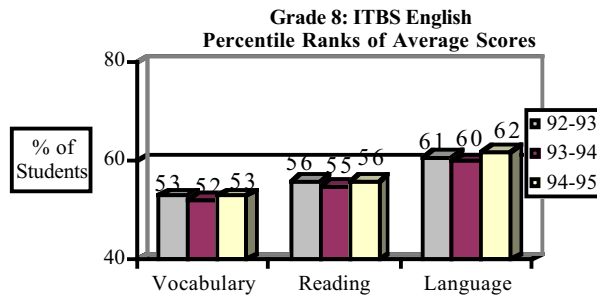
**Table 2 (and corresponding graphs): ITBS Percentile Ranks of Average Scores**  
**ITBS Grade 4**

Year	Vocabulary	Reading	Language	Mathematics
1992-93	55	56	63	63
1993-94	54	55	63	63
1994-95	54	56	64	66



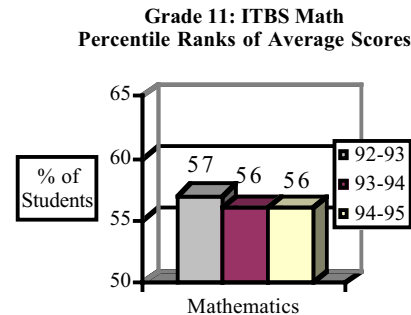
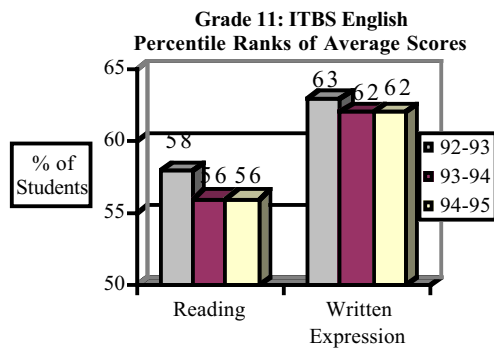
### ITBS Grade 8

Year	Vocabulary	Reading	Language	Mathematics
1992-93	53	56	61	56
1993-94	52	55	60	54
1994-95	53	56	62	55



### ITBS Grade 11

Year	Reading	Written Expression	Mathematics
1992-93	58	63	57
1993-94	56	62	56
1994-95	56	62	56



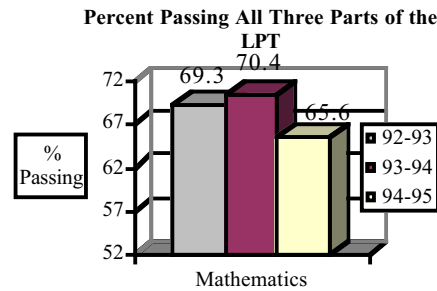
### Virginia Literacy Testing Program

Instituted in 1986, the Literacy Passport Test (LPT) was developed to assess the most basic skills of students in reading, writing, and math<sup>1</sup>. In the years prior to the implementation of the SOL Reforms, on average close to one in three students failed to pass all three parts of the test; the percent of students passing was on the decline (close to four percentage points from 1993 to 1995). (Table 3)

<sup>1</sup> The LPT was to be administered to grade six students, who had additional opportunities to take the test if failed.

**Table 3 (and corresponding graph): Percent Passing All Three Parts of the LPT**

Year	Percent Passing
1992-1993	69.3
1993-1994	70.4
1994-1995	65.6



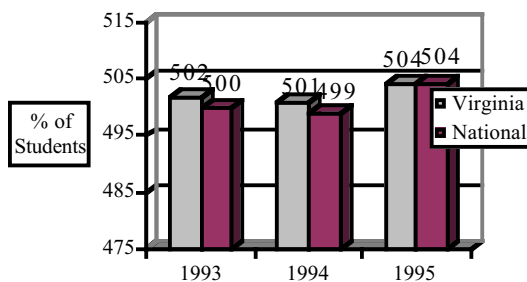
### SAT-I Results

In 1994, prior to the implementation of the SOL reforms, SAT-I verbal scores declined slightly, and then rose by three percentage points in 1995. Mathematics scores during the same time period were static. Whereas prior to 1995, Virginia's verbal score had exceeded the national average, Virginia failed to stay ahead of the national average in 1995. In mathematics, Virginia's average score in 1995 fell from eight points below the national average to 12 points below the national average. (Table 4)

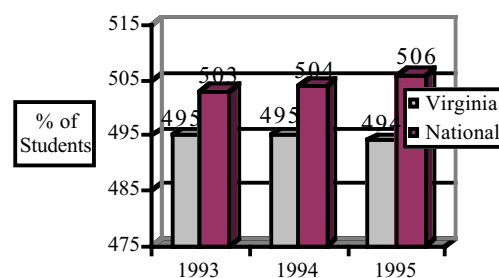
**Table 4 (and corresponding graphs): SAT-I Results – Verbal and Mathematics**

Year	Verbal		Mathematics	
	Virginia	National	Virginia	National
1993	502	500	495	503
1994	501	499	495	504
1995	504	504	494	506

SAT I: Verbal



SAT I: Mathematics



## Section III

### Academic Performance Since the Implementation of the SOL Reforms

**QUESTION: What are the statewide trends in student achievement since the implementation of the SOL reforms, as measured by SOL tests?**

What this level of inquiry tells us: Looking at trends in assessment data – in this case data tracked over five years – are more reliable than looking at data from a single year. A key goal of school divisions throughout the state is not only to get as many students as possible to score proficient on state tests, but to maintain a strong positive trajectory in trends over time. In this analysis, progress was examined in terms of students moving from the *not meeting* the standard level into the *proficient* level, and students moving from the *proficient* into the *advanced proficient* level. To report on the performance of only those students who are *at least proficient* would be to miss much of Virginia's reform.

Findings: As indicated in tables and graphs below, during the past five years Virginia's students have made significant improvements in moving students out of the lowest performance level into the proficient level of reading and mathematics achievement as measured by the SOL tests in Grades 3, 5 and 8. There also have been significant improvements in moving students into the advanced proficient level in mathematics, but only modest success in moving students into the advanced proficient level in reading at the same grade levels.

The increase in achievement has been significant at the high school level on the *end-of-course* tests – especially the scores in important gateway mathematics courses such as Algebra I, Algebra II, and Geometry.

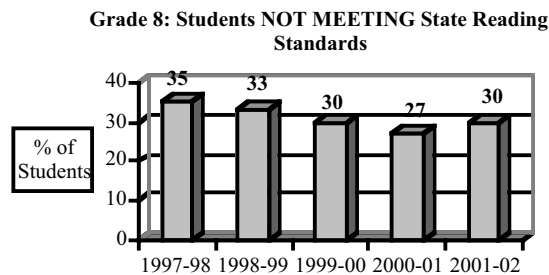
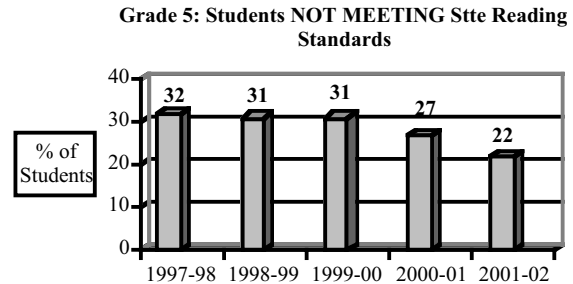
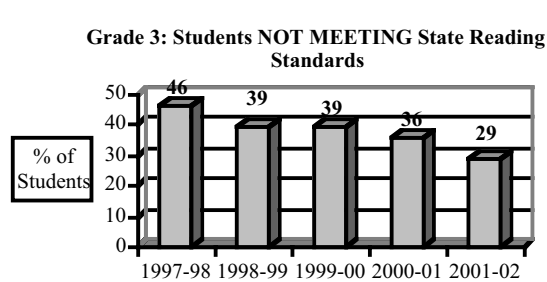
#### **Reading: SOL Statewide Performance (Tables 5-7)**

Since the introduction of the SOL reforms, the percent of students *not meeting* the state standards in reading meaningfully declined in all three grades tested since 1998, with the smallest decline in Grade 8.

Another way of looking at the same information shows that the percent of students who scored *at least proficient* steadily increased across all grades tested: 17 percentage points, 10 points, and five points, respectively. (Table 5) The percent of students who scored at the *advanced* level increased modestly in five years across all grades tested – from five to six percentage points.

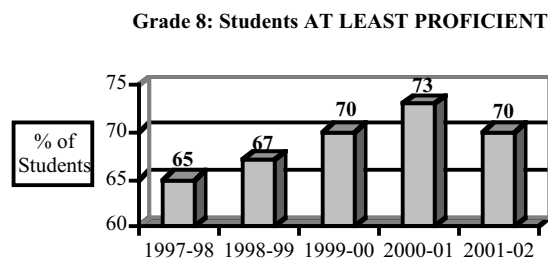
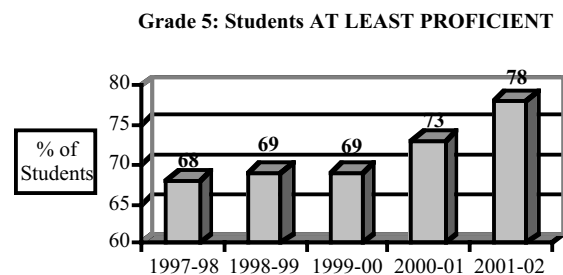
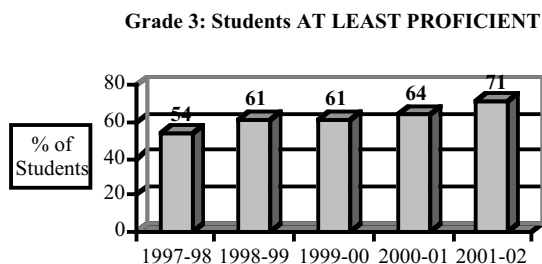
**Table 5 (and corresponding graphs): Percent of Students NOT MEETING State Reading Standards**

Grade	1997-98	1998-99	1999-00	2000-01	2001-02
3	46	39	39	36	29
5	32	31	31	27	22
8	35	33	30	27	30



**Table 6 (and corresponding graphs): Percent of Students Scoring AT LEAST PROFICIENT in Reading**

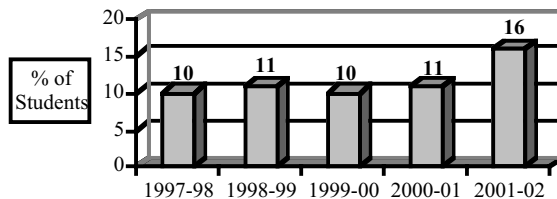
Grade	1997-98	1998-99	1999-00	2000-01	2001-02
3	54	61	61	64	71
5	68	69	69	73	78
8	65	67	70	73	70



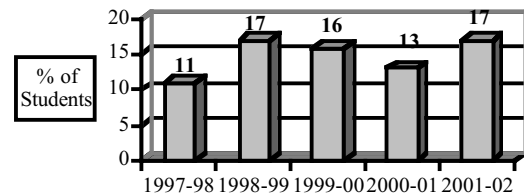
**Table 7 (and corresponding graphs): Percent of Students Scoring ADVANCED PROFICIENT in Reading**

Grade	1997-98	1998-99	1999-00	2000-01	2001-02
3	10	11	10	11	16
5	11	17	16	13	17
8	14	16	21	21	19

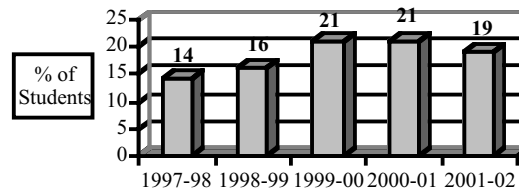
**Grade 3: Students at ADVANCED PROFICIENT**



**Grade 5: Students at ADVANCED PROFICIENT**



**Grade 8: Students at ADVANCED PROFICIENT**



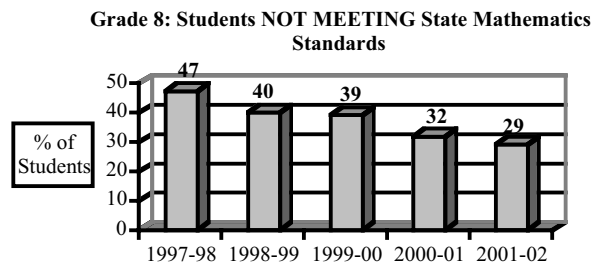
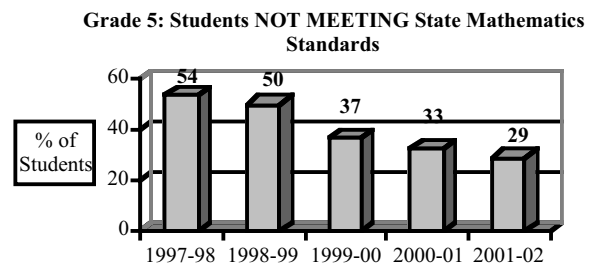
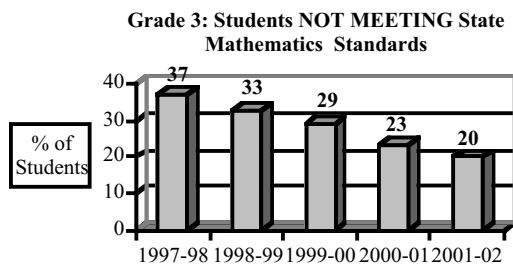
### **Mathematics: SOL Statewide Performance (Tables 8 – 10)**

Since the introduction of the SOL reforms the percent of students who are *not proficient* or *not meeting* the state standard in mathematics declined significantly in all three grades tested. (Table 8) Correspondingly, the percent of students who scored *at least proficient* significantly increased in all grades tested (from 17 to 25 percentage points) in five years. (Table 9)

Real improvements in terms of the percent of students scoring at the *advanced proficient* level also occurred during this time period. The improvements were notable in all three grades with the percent of students almost doubling at Grade 3, more than tripling at Grade 5, and more than doubling at Grade 8. (Table 10)

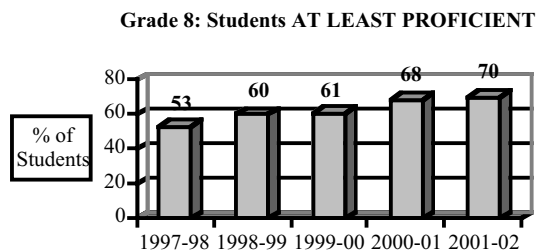
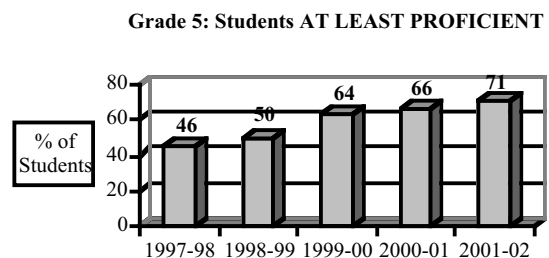
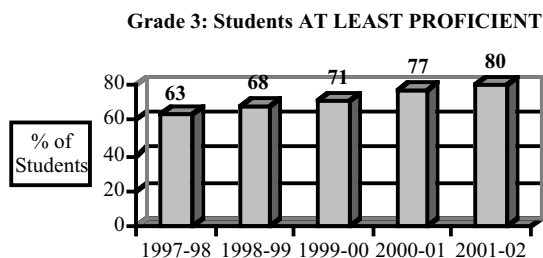
**Table 8 (and corresponding graphs): Percent of Students NOT MEETING State Mathematics Standards**

Grade	1997-98	1998-99	1999-00	2000-01	2001-02
3	37	33	29	23	20
5	54	50	37	33	29
8	47	40	39	32	29



**Table 9 (and corresponding graphs): Percent of Students Scoring AT LEAST PROFICIENT in Mathematics**

Grade	1997-98	1998-99	1999-00	2000-01	2001-02
3	63	68	71	77	80
5	46	50	64	66	71
8	53	60	61	68	70

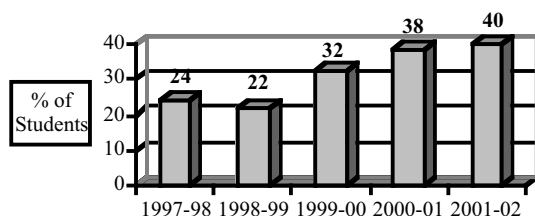


**Table 10 (and corresponding graphs): Percent of Students Scoring ADVANCED PROFICIENT in Mathematics**

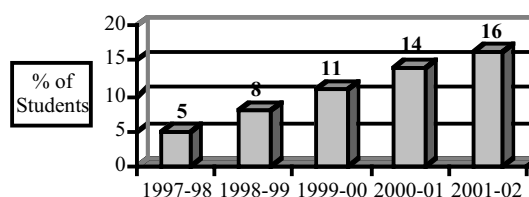
Grade	1997-98	1998-99	1999-00	2000-01	2001-02
3	24	22	32	38	40
5	5	8	11	14	16
8	7	6	9	13	18



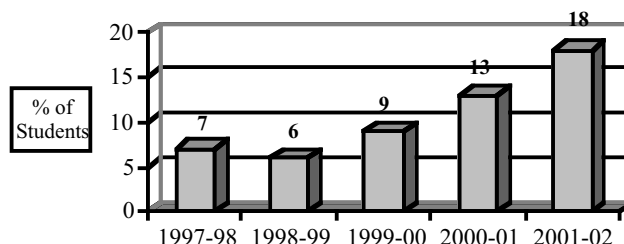
Grade 3: Students at ADVANCED PROFICIENT



Grade 5: Students at ADVANCED PROFICIENT



Grade 8: Students at ADVANCED PROFICIENT



### ***End-Of-Course Tests: SOL Statewide Performance (Tables 11-18)***

The increase in achievement as measured by the high school SOL *end-of-course* tests and summarized below has been notable at the high school level from 1998-2002, especially the scores in important gateway mathematics courses:

- In English, there was a 14 percentage point increase in the percent of students passing English/Reading and a 15 percentage point increase in the percent of students passing English/Writing. (Table 11) The percent of students scoring advanced in reading nearly doubled from 1998 to 2002; the percent of students scoring advanced in writing more than doubled in the same time period. (Table 12)
- In mathematics, there was a 38 percentage point increase in the percent of students passing Algebra I, a 46 percentage point increase in the percent of students passing Algebra II, and a 24 percentage point increase in the percent of students passing Geometry. (Table 13) The percent of students scoring advanced in Algebra I in 2002 was only 13 percent but that is 10 percentage points higher than in 1998. There were significant increases from 1998-2002 in the percent of students scoring advanced in Algebra II and Geometry --25 and 19 percentage points, respectively (Table 14).
- In history, there was a 24 percentage point increase in the percent of students passing World History I, a 38 percentage point increase in the percent of students passing World History II, and a 42 percentage point increase in the percent of students passing U.S. History. (Table 15) While the percents remain somewhat low, there were significant increases in the percent of students scoring advanced in World History I and US History from 1998-2002. The percent of students scoring advanced in World History II in 1998 was small and that percent increased by only 5 percentage points in four years. (Table 16)
- In science, there was a 12 percentage point increase in the percent of students passing Earth Science; an 11 percentage point increase in the percent of students passing Biology; and a 24 percentage point increase in the percent of students passing Chemistry. (Table 17) The percent of students scoring advanced is small

in all three sciences and increased only slightly in Earth Science and Biology from 1998-2002. (Table 18)

**Table 11: END-OF-COURSE TEST: Percent Passing or Above**

	ENGLISH:READING		ENGLISH:WRITING	
	1998	2002	1998	2002
	% Passing or Above	% Passing or Above	% Passing or Above	% Passing or Above
Statewide	72%	86%	71%	86%

**Table 12: END-OF-COURSE TEST: Percent Advanced**

	ENGLISH:READING		ENGLISH:WRITING	
	1998	2002	1998	2002
	% Advanced	% Advanced	% Advanced	% Advanced
Statewide	17%	28%	11%	25%

**Table 13: END-OF-COURSE TEST: Percent Passing or Above**

	ALGEBRA I		ALGEBRA II		GEOMETRY	
	1998	2002	1998	2002	1998	2002
	% Passing or Above	% Passing or Above	% Passing or Above	% Passing or Above	% Passing or Above	% Passing or Above
Statewide	40%	78%	31%	77%	52%	76%

**Table 14: *END-OF-COURSE* TEST: Percent Advanced**

	ALGEBRA I		ALGEBRA II		GEOMETRY	
	1998	2002	1998	2002	1998	2002
	% Advanced	% Advanced	% Advanced	% Advanced	% Advanced	% Advanced
Statewide	3%	13%	3%	23%	4%	19%

**Table 15: *END-OF-COURSE* TEST: Percent Passing or Above**

	WORLD HISTORY I		WORLD HISTORY II		US HISTORY	
	1998	2002	1998	2002	1998	2002
	% Passing or Above	% Passing or Above	% Passing or Above	% Passing or Above	% Passing or Above	% Passing or Above
Statewide	62%	86%	41%	79%	30%	72%

**Table 16: *END-OF-COURSE* TEST: Percent Advanced**

	WORLD HISTORY I		WORLD HISTORY II		US HISTORY	
	1998	2002	1998	2002	1998	2002
	% Advanced	% Advanced	% Advanced	% Advanced	% Advanced	% Advanced
Statewide	5%	17%	3%	8%	3%	13%

**Table 17: END-OF-COURSE TEST: Percent Passing or Above**

	EARTH SCIENCE		BIOLOGY		CHEMISTRY	
	1998	2002	1998	2002	1998	2002
	% Passing or Above	% Passing or Above	% Passing or Above	% Passing or Above	% Passing or Above	% Passing or Above
<b>Statewide</b>	<b>58%</b>	<b>70%</b>	<b>72%</b>	<b>83%</b>	<b>54%</b>	<b>78%</b>

**Table 18: END-OF-COURSE TEST: Percent Advanced**

	EARTH SCIENCE		BIOLOGY		CHEMISTRY	
	1998	2002	1998	2002	1998	2002
	% Advanced	% Advanced	% Advanced	% Advanced	% Advanced	% Advanced
<b>Statewide</b>	<b>4%</b>	<b>8%</b>	<b>6%</b>	<b>10%</b>	<b>2%</b>	<b>8%</b>

**QUESTION: To what extent are major ethnic groups participating in the improved SOL test scores?**

What this level of inquiry tells us: Student achievement can be measured in many ways. Monitoring scores for students on a statewide basis (presented earlier) is one method. Another crucial way to examine student performance is to disaggregate performance based on race and socio-economics. For too long, some state policymakers in the nation have worried that disaggregating data by race and poverty would create negative stereotypes — that the information would be used as a weapon against minority and low-income students rather than as a tool for improvement. However, there is much research evidence and StandardsWork's own Results Card®<sup>2</sup> to show that systems that continue to evaluate aggregated "averaged" scores do not have a clear picture of what is working and what is not and for which group of students. Once sub-group data are reviewed and discussed, teachers and administrators can begin to correct the attitudes, behaviors, policies, and practices that lead to the poor performance of any subgroup of students.

**Findings:** While the number of students tested in each subgroup differs widely (the smaller the population tested, the less reliable are the results), there has been noteworthy improvement for each ethnic group, especially at Grades 3 and 5. The only modest or slightly negative trend was registered in Grade 8 reading for three of the five ethnic groups.

<sup>2</sup> Arizona, Colorado, Florida, Georgia, Maryland, Ohio, Pennsylvania, Texas and Virginia participated in *The 2001 Results Card*.

Again, at high school, every ethnic group improved on every one of the eleven *end-of-course* tests. There also were meaningful reductions in the performance gap between ethnic groups. While achievement gaps still remain, the question to ask now is what will be done to maintain the momentum of the past several years?

### **Reading: SOL Statewide Performance by Ethnic Group for Grades 3, 5 & 8.**

In reading every ethnic group in Grades 3 and 5 benefited (in terms of significantly improved SOL scores) since the introduction of the SOL program. Although somewhat positive, the performance of the ethnic groups in Grade 8 is modest for some, and slightly negative for others. (Table 19)

**Table 19: Statewide SOL Reading/English**

	<b>Grade 3</b>		<b>Grade 5</b>		<b>Grade 8</b>	
	<b>1998</b>	<b>2002</b>	<b>1998</b>	<b>2002</b>	<b>1998</b>	<b>2002</b>
	<b>% Passing</b>	<b>% Passing</b>	<b>% Passing</b>	<b>% Passing</b>	<b>% Passing</b>	<b>% Passing</b>
	<b># students tested</b>	<b>#students tested</b>	<b># students tested</b>	<b># students tested</b>	<b># students tested</b>	<b># students tested</b>
<b>African American</b>	33%	55%	47%	62%	45%	51%
	23,156	23,585	20,701	23,555	19,907	21,406
<b>Am. Indian Alaskan Native</b>	63%	78%	68%	75%	61%	61%
	396	271	395	265	457	331
<b>Asian/Pacific Islander</b>	72%	82%	81%	87%	80%	79%
	2,286	3,496	2,541	3,523	2,763	3,549
<b>Caucasian</b>	64%	79%	76%	85%	72%	77%
	54,790	51,803	53,428	54,396	52,394	53,605
<b>Hispanic</b>	50%	59%	64%	68%	58%	55%
	2,145	4,329	2,210	4,338	2,466	3,845

### **Mathematics: SOL Statewide Performance by Ethnic Group for Grades 3, 5 and 8**

In mathematics every ethnic group, in all grades tested, obtained improved SOL test scores since the introduction of the SOL reforms. (Table 20)

**Table 20: Statewide SOL Mathematics**

	Grade 3		Grade 5		Grade 8	
	1998	2002	1998	2002	1998	2002
	% Passing	% Passing	% Passing	% Passing	% Passing	% Passing
	# students tested	# students tested	# students tested	# students tested	# students tested	# students tested
<b>African-American</b>	40%	65%	24%	53%	27%	51%
	24,242	24,024	20,763	23,685	20,661	21,922
<b>Am. Indian-Alaskan Native</b>	70%	82%	49%	69%	49%	62%
	396	281	394	267	487	355
<b>Asian/Pacific Islander</b>	85%	90%	69%	87%	77%	88%
	2,292	3,572	2,541	3,575	2,969	3,920
<b>Caucasian</b>	73%	87%	54%	79%	61%	78%
	54,947	52,240	53,539	54,640	58,400	57,617
<b>Hispanic</b>	61%	73%	41%	61%	47%	60%
	2,146	4,513	2,208	4,429	2,618	4,176

### **High School *End-Of-Course* Tests by Ethnic Group**

Every ethnic group exhibited significantly improved SOL scores on the high school *end-of-course* tests – since the introduction of the SOL testing program.

1. In 2002, a large majority of Virginia's students from each ethnic group passed the reading and writing *end-of-course* test. (Table 21)
2. In mathematics the progress was considerable. In Algebra I, the smallest gain for any ethnic group in five years was 30 percentage points; the largest was a 44 percentage point gain registered by African American students. In Algebra II, the gain runs from 34 percentage points to 49 percentage points, with the biggest gain again registered by African American students. Similarly, in Geometry, the gains run from 20 to 28 points, with the biggest gain registered by African American students. (Table 22)
3. Notable gains were registered in history (Table 23) and science. (Table 24)

There also were meaningful and in some cases extensive reductions in the *performance gap* between Caucasian students and other ethnic groups between 1998 and 2002, as indicated in Tables 21-24.

1. The achievement gap has narrowed between Caucasian students and African-American students in reading, writing, Algebra I, Algebra II, Geometry, World History I and II, Earth sciences, Biology, and Chemistry. Only in US History has the gap remained essentially the same, although both sub-groups improved their individual performances substantially.
2. The gap between Caucasian and American Indian-Alaskan Native students decreased in seven out of 11 *end-of-course* tests.
3. The gap between Caucasian and Hispanic students decreased in four of the eleven subjects tested.

**Table 21: Statewide End-of-Course Test Reading & Writing**

	English/Reading		English/Writing	
	1998	2002	1998	2002
	% Passing	% Passing	% Passing	% Passing
	# students tested	# students tested	# students tested	# students tested
<b>African-American</b>	55% 12,597	76% 14,036	54% 12,865	75% 13,960
<b>Am. Indian-Alaskan Native</b>	67% 406	88% 298	63% 376	85% 351
<b>Asian/Pacific Islander</b>	78% 2,865	88% 3,365	79% 2,855	89% 3,456
<b>Caucasian</b>	77% 39,277	90% 41,950	76% 39,987	89% 41,752
<b>Hispanic</b>	64% 1,891	79% 2,569	63% 1,886	80% 2,670

**Table 22: Statewide End-of-Course Test Algebra I, Algebra II, and Geometry**

	Algebra I		Algebra II		Geometry	
	1998	2002	1998	2002	1998	2002
	% Passing	% Passing	% Passing	% Passing	% Passing	% Passing
	# students tested	# students tested	# students tested	# students tested	# students tested	# students tested
<b>African-American</b>	20% 15,985	64% 17,800	13% 7,524	62% 8,887	25% 10,196	53% 14,544
<b>Am. Indian-Alaskan Native</b>	33% 508	71% 344	28% 287	72% 185	51% 345	72% 246
<b>Asian/Pacific Islander</b>	61% 3,158	91% 3,836	50% 2,598	84% 3,365	67% 2,704	87% 3,555
<b>Caucasian</b>	46% 48,400	83% 49,633	34% 30,218	80% 34,741	59% 35,984	83% 43,497
<b>Hispanic</b>	33% 2,686	72% 3,848	26% 1,291	69% 1,903	47% 1,701	71% 2,903

**Table 23: Statewide End-of-Course World History I, World History II, and US History**

	World History I		World History II		US History	
	1998	2002	1998	2002	1998	2002
	% Passing	% Passing	% Passing	% Passing	% Passing	% Passing
	# students tested	# students tested	# students tested	# students tested	# students tested	# students tested
<b>African-American</b>	38%	73%	17%	61%	12%	53%
	6,415	12,366	6,274	12,611	13,248	15,257
<b>Am. Indian-Alaskan Native</b>	64%	83%	43%	72%	28%	76%
	253	222	168	260	433	311
<b>Asian/Pacific Islander</b>	77%	93%	62%	87%	39%	76%
	1,923	3,232	959	3,345	2,916	3,536
<b>Caucasian</b>	68%	90%	49%	85%	36%	79%
	23,528	36,601	18,007	37,588	39,748	42,961
<b>Hispanic</b>	52%	77%	33%	68%	19%	60%
	1,380	3,038	837	3,332	2,077	2,973

**Table 24: Statewide End-of-Course Earth Science, Biology, and Chemistry**

	Earth Science		Biology		Chemistry	
	1998	2002	1998	2002	1998	2002
	% Passing	% Passing	% Passing	% Passing	% Passing	% Passing
	# students tested	# students tested	# students tested	# students tested	# students tested	# students tested
<b>African American</b>	31%	49%	50%	68%	31%	59%
	15,599	19,960	16,013	16,901	7,663	7,817
<b>Am. Indian-Alaskan Native</b>	58%	73%	70%	82%	47%	77%
	437	300	555	310	318	193
<b>Asian/Pacific Islander</b>	68%	74%	79%	86%	62%	82%
	1,585	2,624	3,394	3,935	2,824	3,127
<b>Caucasian</b>	69%	80%	81%	90%	60%	84%
	37,131	43,210	44,618	46,483	30,231	29,828
<b>Hispanic</b>	51%	56%	61%	69%	41%	64%
	1,777	3,245	2,737	3,901	1,501	1,887



**QUESTION: What are the trends in student achievement on other statewide achievement tests that are not part of the state accountability system, and how do they compare with the trends on the SOL?**

What this level of inquiry tells us: Comparing the results of other assessments that are not part of the state's accountability program with those on the SOLs help to confirm *how real* the observed gains on the SOL tests are, as they are validated by other measures. A further examination of the relationship between the SOL assessment results and the SAT-I results demonstrate whether what students are learning in order to pass the SOLs is translating into better performance on other tests.

**Findings:** Evidence suggests that the gains produced by the SOL accountability system are real indicators of improvement in learning. Concurrent improvements (with those found on the SOL assessments) in NAEP and SAT-I are notable. However, SAT-9 results are more mixed. In Grades 4 and 6, SAT-9 improvements are noteworthy. But, at Grade 9, the SAT-9 improvements in reading and mathematics are not consistent with the gains on the SOLs, NAEP or SAT-I. The fact that SAT-9 is a "low-stakes test" without any reward or punishment attached to student or school performance may be a factor. There are few incentives for students (or schools) to take the exam seriously and put forth their best effort. Whatever the reasons, the dissonance in the results deserves more attention and study. A further level of inquiry would be to look at whether the schools achieving the highest scores on the SOLs also have the highest scores on the SAT-9 and, likewise, whether schools with the lowest SOL scores have the lowest results on the SAT-9. Perhaps the SAT-9 2002 results will shed additional light on this issue; those data were not yet available.

### **NAEP Results: Mathematics and Verbal<sup>3</sup>**

Improvement in mathematics as measured by NAEP greatly accelerated at Grades 4 and 8 since the introduction of the SOL reforms, resulting in Virginia registering some of the top gains in the nation. Improvement in reading also accelerated since the introduction of the SOL reforms in Grade 4. In addition, Virginia students outperformed both students in the Southeast region and in the nation on the 1998 Grade 8 NAEP reading and writing assessments – the first time Virginia participated in the assessments at this grade level. Just as we found in the SOL assessment results, there have been meaningful improvements for each ethnic group on NAEP.

### **Mathematics**

1. The reduction (from 1996-2000) in the percent of students scoring below basic was significant at Grade 4. At Grade 8, the reduction from 1992-1996 was a mere one percentage point but the reduction accelerated to 9 percentage points from 1996 to 2000.
2. Seventy-three percent of Virginia's fourth graders performed *at or above the basic* level in 2000 compared to only 62 percent in 1996, and 59 percent in 1992. (Table 25)

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<sup>3</sup> Virginia met the NCES established participation rate guidelines in reading and math and was free of any notation to indicate the possibility of bias in the sample tested.

3. After no improvement from 1992 to 1996, the percent of Virginia students scoring *at or above proficient* increased 6 percentage points at Grade 4 from 1996-2000; at Grade 8 the improvement from 1996 to 2000 (five point gain) was more than double the increase registered from 1992-1996 (two point gain). (Tables 25 and 26)
4. The gains in the scale score made by Virginia students on the 2000 NAEP were among the highest in the nation. (Virginia's fourth grade gains in scale scores were tied with one other state to be the second best in the nation; the eighth grade gains were tied with one other state to be the third best in the nation.) The average score of Virginia's students exceeded the average score both for the southeast region (by a significant amount) and for the nation. (Tables 25 and 26)
5. Performance at the *advanced* level remained flat at Grade 4 and there were only modest improvements (two percentage points) at Grade 8. (Tables 25 and 26)

### Reading and Writing

1. Improvements in performance for Grade 4 in 1998 compensated for most of the ground lost in reading between 1992 and 1994. (Table 27)
2. The average scale score of Virginia's fourth graders on NAEP reading rose five points since 1994; a score that is considerably higher than the regional average and slightly higher than the national average. (Table 27)
3. Performance at the *advanced* level in Grade 4, however, remained static pre- and post-introduction of the SOL reforms. (Table 27)
4. Virginia students outperformed students (as measured by the scale score) both in the region and in the nation on the 1998 eighth grade NAEP reading and writing assessments. (Table 28 and 29)
5. Seventy-eight percent of students scored *at or above basic* on the reading test; one third of them scored *at or above proficient*. (Table 28)
6. Eighty-nine percent of Virginia's Grade 8 students scored *at or above basic* on writing. (Table 29)
7. On both assessments, only a handful of other states have a higher percentage of their students scoring *at or above proficient*.
8. On both tests, however, only a handful of students scored at the *advanced* level. (Tables 28 and 29)

**Table 25: Statewide NAEP Mathematics - Grade 4 Percent of Students By Proficiency Level**

Year	Below Basic	At or Above Basic <sup>4</sup>	At or Above Proficient	Advanced	Scale Scores		
					VA	SE Region	Nation
1992	41	59	19	2	221	210	219
1996	38	62	19	2	223	216	222
2000	27	73	25	2	230	220	226

<sup>4</sup> *At or Above Basic* includes *At or Above Proficient* and *Advanced*

**Table 26: Statewide NAEP Mathematics - Grade 8 Percent of Students by Proficiency Level**

Year	Below Basic	At or Above Basic	At or Above Proficient	Advanced	Scale Scores		
					VA	SE Region	Nation
1992	43	57	19	3	268	259	267
1996	42	58	21	3	270	264	271
2000	33	67	26	5	277	265	274

**Table 27: Statewide NAEP Reading – Grade 4 Percent of Students by Proficiency Level**

Year	Below Basic	At or Above Basic	At or Above Proficient	Advanced	Scale Scores		
					VA	SE Region	Nation
1992	33	67	31	6	221	211	215
1994	43	57	26	7	213	208	212
1998	36	64	30	6	218	210	215

**Table 28: Statewide NAEP Reading - Grade 8 Percent of Students by Proficiency Level**

Year	Below Basic	At or Above Basic	At or Above Proficient	Advanced	Scale Scores		
					VA	SE Region	Nation
1998	22	78	33	3	266	258	261

**Table 29: Statewide NAEP Writing - Grade 8 Percent of Students by Proficiency Level**

Year	Below Basic	At or Above Basic	At or Above Proficient	Advanced	Scale Scores		
					VA	SE Region	Nation
1998	11	89	27	1	153	145	148

### Mathematics – Ethnic Group Results

1. The percentage of African-American and Caucasian students who moved out of the lowest proficiency level (*below basic*) in Grade 4 is noteworthy: There was a 21 percentage point reduction for Grade 4 African American students from 1992 – 2000 and a 16 percentage point reduction for Caucasian students. The majority of the gains for both sub-groups of students were made since 1996. Both groups are advancing out of the lowest proficiency level but a majority of African American students remain in the *below basic* category, and only single-digit percentages are *at or above proficient*. This remains an area of opportunity for improving achievement. (Table 30)
2. At Grade 8, despite deteriorating African American student performance and no improvement for Hispanic students from 1992 to 1996, both subgroups of students showed significant achievement gains by 2000. Both African-American and Hispanic students registered a 12 point reduction in the percent of students scoring *below basic* from 1996 to 2000. (Table 31)
3. The percentage of African-American students performing at or above the *basic* level rose by 12 points in Grades 4 and 8 from 1996 to 2000. The performance of Hispanic and Asian students also improved significantly on the 2000 tests, especially at Grade 8. (Tables 30 and 31)

4. While Caucasian and Asian students registered solid gains in the percent *scoring at or above proficient* at Grade 4, African American and Hispanic students registered only modest improvements. In Grade 8, African American student performance has been static since 1992 at the *proficient* level. Grade 8 Caucasian, Hispanic and Asian student performance improvement at the *proficient* level has been solid (five, five, and 11 percentage point increases, respectively). (Tables 31)
5. At the *advanced* level in Grade 8 – where there has been little progress in the state overall – the percent of Asian students scoring at the *advanced* level improved by 10 percentage points since 1992; seven of those points since 1996. (Table 31)

**Table 30: Statewide NAEP Mathematics – Grade 4 Percent of Students By Ethnicity And Proficiency**

Ethnic Group	Below Basic			At or Above Basic			At or Above Proficient			Advanced		
	1992	1996	2000	1992	1996	2000	1992	1996	2000	1992	1996	2000
Caucasian	30	27	14	70	73	86	25	25	35	3	2	3
African-American	75	66	54	25	34	46	3	4	6	0	0	0
Hispanic	52	48	41	48	52	59	9	9	11	0	0	0
Asian	18	20	12	82	80	88	26	39	45	6	8	8

**Table 31: Statewide NAEP Mathematics – Grade 8 Percent of Students By Ethnicity And Proficiency**

Ethnic Group	Below Basic			At or Above Basic			At or Above Proficient			Advanced		
	1992	1996	2000	1992	1996	2000	1992	1996	2000	1992	1996	2000
Caucasian	34	29	22	66	71	78	24	28	33	3	4	6
African-American	71	74	62	29	26	38	4	4	5	0	0	1
Hispanic	56	56	44	44	44	56	11	9	14	0	2	1
Asian	29	26	11	71	74	89	32	38	49	4	7	14

### Reading – Ethnic Group Results

- I. Since the introduction of the SOL reforms, the percent of Grade 4 African-American students scoring *below basic* decreased 14 percentage points with corresponding increases in the percent of students scoring *at or above basic* (14 percentage points) and *at or above proficient*: 5 percentage points. (Table 32)

2. All sub-groups of students, except Hispanic students, made noteworthy gains from 1994 to 1998, in terms of the percent of students scoring *at or above basic* and the percent of students scoring *at or above proficient*. At the *advanced* level sub-groups either declined or remained the same.

**Table 32: Statewide NAEP Reading – Grade 4 Percent of Students By Ethnicity And Proficiency Level**

Ethnic Group	Below Basic			At or Above Basic			At or Above Proficient			Advanced		
	1992	1994	1998	1992	1994	1998	1992	1994	1998	1992	1994	1998
Caucasian	24	30	26	76	70	74	40	35	38	9	10	8
African-American	56	69	55	44	31	45	12	8	13	1	1	1
Hispanic	55	51	56	45	49	44	12	20	13	1	4	2
Asian	24	28	24	76	72	76	39	42	38	7	11	12

### **SAT-9 Percentile Ranks of Average Scores:**

While 2002 scores were not available at the writing of this report, the results of four years of the norm-referenced tests in Grade 4 shows significant improvements in all three areas tested, while Grade 6 shows significant improvements in two out of three areas tested. In Grade 9, language shows significant improvement, while reading and mathematics scores are somewhat flat (Tables 33, 34, and 35). These results may be a function of the fact that the state's academic standards in the middle school years are not highly correlated with the SAT-9 content. This issue warrants further exploration and explanation.

**Table 33: Statewide Grade 4 SAT-9 Percentile Scores**

Year	Reading	Language	Mathematics
1998	50	54	53
1999	52	57	57
2000	53	60	60
2001	54	61	61
Change	+4	+7	+8

**Table 34: Statewide Grade 6 SAT-9 Percentile Scores**

Year	Reading	Language	Mathematics
1998	58	51	58
1999	59	53	62
2000	59	55	65
2001	59	55	66
Change	+1	+4	+8

**Table 35: Statewide Grade 9 SAT-9 Percentile Scores**

Year	Reading	Language	Mathematics
1998	58	48	54
1999	60	50	55
2000	60	51	55
2001	60	52	55
Change	+1	+4	+1

**SAT-I Average Verbal and Math Scores**

Both the verbal and the mathematics SAT-I scores increased steadily since 1995. The cumulative gain in Virginia's verbal scores was six points (while there was no gain at the national level). The cumulative gain in Virginia's math score was 12 points – a bit higher than the gain nationally – although Virginia's average math score remains 10 points below the national average. (Table 36)

**Table 36: Statewide SAT-I Verbal and Mathematics Scores**

Year <sup>5</sup>	Verbal		Mathematics	
	Virginia	National	Virginia	National
1995	504	504	494	506
1996	507	505	496	508
1997	506	505	497	511
1998	507	505	499	512
1999	508	505	499	511
2000	509	505	500	514
2001	510	506	501	514
2002	510	504	506	516

1. From 1995 to 2002, Virginia's verbal scores increased six points, while the nation's average score stayed the same. (Table 36)
2. Virginia's students scored higher on the verbal portion of the SAT-I than the national average by six points in 2002. (Table 36) Note that in 2002, 68 percent of Virginia students took the test while nationally only 46 percent of students took the test. The common expectation is that more test takers – beyond the top students – results in lower scores. (Table 36)
3. From 1995 to 2002, Virginia gained 12 points in math, while nationally 10 points were gained. Still, Virginia's seniors scored lower on the mathematics portion of the SAT-I than the national average by 10 points in 2002. (Table 36)

**QUESTION: To what extent has Virginia seen an increase in positive practices following the implementation of the SOL reforms, including more students succeeding in rigorous curricula or preparing to attend college?**

What this level of inquiry will tell us: This analysis includes statewide trends in the percent of students taking honors classes and tests such as Advanced Placement (AP), International Baccalaureate (IB), and SAT-I. These measures provide evidence

<sup>5</sup> Beginning in 1997, SAT-I scores were recentered nationally. These 1997-2002 data are according to the recentered scale.

of the degree to which students complete a rigorous academic program and are prepared to meet state requirements at advanced levels. Since SATs are historically only taken by students aspiring to go to college, this indicator provides evidence both of student intent to attend college and skill levels.

**Findings:** With the onset of the SOL reforms, the number of Virginia's AP enrollments, the number of AP scores of "3" or above, and the number of enrollments and diplomas earned in International Baccalaureate have all increased. SAT-I participation rates in 2002 are higher than the 1995 rate, although the rate fluctuated between one and three points from 1997 through 2000.

### Statewide Advanced Placement Data

The number of Advanced Placement (AP) candidates increased 50 percent from 1998 to 2002. (High school enrollments increased by 9.2 percent from 1998-2001. The number of exams grew 59 percent during the same period, however, the percent of pass scores (3 or above) on the exams dropped from 39 percent to 34 percent between 1998 and 2001. (Table 37) Monitoring these numbers is significant for two reasons: First, students who receive a score of "3" or better on an AP exam can qualify at many colleges to skip an equivalent course – a savings that translates into an average of \$3,000 per course. Some colleges even allow students who pass a sufficient number of AP tests to enter as sophomores. Moreover, students who score a "3" or better is at least equivalent to students scoring in the *advanced* level on the SOL *end-of-course* tests. Virginia has been counting these AP scores only for accreditation purposes. Since the AP tests are an "allowable" alternative to taking the Virginia *end-of-course* tests, consideration could be given to reporting students' high scores on AP as having reached *advanced proficient*. Doing so will likely enlarge the improvements and provide the encouragement students need to aim higher.

**Table 37: Advanced Placement Performance**

Year	# of Candidates	# AP Exams	# AP Exams Scored 3 or Above
1998	23,214	39,449	15,437
1999	28,047	49,061	15,263
2000	29,016	51,275	16,156
2001	31,598	56,144	19,120
2002	34,785	62,363	Not available

### Statewide International Baccalaureate Data

The number of students enrolled in IB has almost tripled since 1998 while the number of students earning the IB diploma has more than quadrupled. (Table 38)

**Table 38: Statewide IB Enrollments and Diplomas**

1997 – 98		1998 – 99		1999 – 00		2000 – 01	
IB Course Enrollments	IB Diploma	IB Course Enrollments	IB Diploma	IB Course Enrollments	IB Diploma	IB Course Enrollments	IB Diploma
369	132	509	261	661	358	1008	567

### Statewide SAT-I Test Takers

Virginia's SAT participation rate (students taking the SAT-I) jumped three percentage points to 68 percent in 1996 after the implementation of the first phase of the SOL reforms. That high percent was repeated in 2001 and 2002, although it fluctuated somewhat in the intervening years. (Table 39) The national average participation rate is 46 percent – 22 percentage points below Virginia's participation rate. The number of Virginia's students taking the SAT-I increased by 20 percent from 41,987 in 1995 to 50,447 in 2002. This is an important finding as one of the most significant factors in evaluating SAT scores is the proportion of eligible students taking the exam (i.e., the participation rate). In general, the higher percentage of students taking the test, the lower the average scores. In some states in the nation, a very small percentage of high school students take the SAT. Typically, these students have strong academic backgrounds and are applicants to the nation's most prestigious colleges and selective scholarship programs. In states where a greater proportion of students with a wide range of academic backgrounds take the SAT – like Virginia – the scores would be expected to be lower than the national average. Even with a much higher participation rate, Virginia's average SAT verbal score is higher than the national average, although the SAT math score is lower.

**Table 39: SAT Test-Takers**

<b>Year</b>	<b>Percent of Eligible Students in Virginia Taking the SAT-I</b>
<b>1993</b>	<b>63</b>
<b>1994</b>	<b>64</b>
<b>1995</b>	<b>65</b>
<b>1996</b>	<b>68</b>
<b>1997</b>	<b>69</b>
<b>1998</b>	<b>66</b>
<b>1999</b>	<b>65</b>
<b>2000</b>	<b>67</b>
<b>2001</b>	<b>68</b>
<b>2002</b>	<b>68</b>

**QUESTION: Is there any evidence of negative practices resulting from efforts to improve SOL test scores, including a rise in student absences from tests or dropout rates?**

What this level of inquiry will tell us: Analyzing attendance during the SOL tests is the first step in probing whether negative practices are forming in the state in order to artificially improve scores. If large increases in the number of students not taking the SOL are evident, then SOL scores may be inflated as a result of excluding low-performing students (or deliberately encouraging certain students to be absent on test day).

In looking for relationships between the strength of Virginia's accountability program and any changes in the number of students repeating a grade or failing to make it through their senior year of high school, we compare enrollment figures in Grade 9 with the number of graduates four years later. An analysis of this statewide trend and the dropout rate address questions about whether the new, tougher state



accountability program is encouraging students to leave school, or encouraging schools to *push* students out as a way of increasing scores. Although empirical research on the subject is limited, one study conducted by Cornell University and the University of Michigan<sup>6</sup> found that increasing the demands on high school students raised the dropout rate between three and seven percent a year in some jurisdictions. Another study, conducted by the Consortium for Policy Research in Education<sup>7</sup>, however, did not find any increase in dropout rates nationally.

**Findings:** Test absences and exemptions in 2002 are not high but they are up somewhat from their 1998 levels in both reading and math in all grades assessed. Virginia will want to watch these percentages as the new federal legislation (*No Child Left Behind*) allows only five percent of students to be absent from tests, including special education students. In all three grades in reading and in Grade 8 in mathematics, the percent of students absent or exempt from the SOLs is just over that limit.

There is no evidence that more students are failing to graduate from high school as a result of the SOLs as evidenced by either the percent graduating or the dropout rate but there is a need for closer study into the types of diploma Virginia's students are earning. Students choosing to earn a Standard Diploma are growing at a much faster rate than students choosing to earn an Advanced Diploma. This could be a reflection of school curriculum offerings and/or the failure of school personnel to encourage students to reach higher. While it is a positive that students who may have chosen to dropout in past years are now earning some kind of degree, the number of students earning a "special" diploma of one sort or another has more than doubled since 1997. These special diplomas may be problematic under NCLB. The number of students earning a General Education Development Certificate (GED), which would be excluded in the NCLB graduation rate definition, has nearly tripled in Virginia since 1998.

### Test Absences and Exemptions

Test absences increased since 1998, peaking in 2000 and 2001 in both reading and math. In 2002, the percent of test absences and exemptions declined from their 2001 levels, but it still represents an increase over 1998 levels. The percentages of absences do not seem unreasonable and do not indicate that schools are encouraging their least skilled students to stay at home on testing day or trying to find ways to expand the definition of what qualifies a student for an exemption. However, the percentages are bumping up against the requirements of NCLB. (Tables 40 and 41)

**Table 40: Statewide Percent of Students Absent or Exempt From Mathematics SOL Test\***

Grade	1997 - 98	1998 - 99	1999 - 00	2000 - 01	2001 - 02
3	3.8	4.6	4.6	5.0	4.4
5	3.9	5.2	5.3	5.4	5.0
8	4.7	5.9	6.2	5.8	5.3

(\*Includes absences or exemptions for students with disabilities, Limited English Proficiency, and medical status.)

<sup>6</sup> Olson, Lynn. "Study Links Dropout Rate with Course Requirements." *Education Week*. 29 Mar. 2000.

<sup>7</sup> Consortium for Policy Research in Education, Policy Briefs RB-13, 1994  
Reform of High School Mathematics and Science and Opportunity to Learn.  
Andrew C. Porter and Associates

**Table 41: Statewide Percent of Students Absent or Exempt From Reading SOL Test\***

Grade	1997 - 98	1998 - 99	1999 - 00	2000 - 01	2001 - 02
3	4.0	1.6	5.2	5.8	5.7
5	4.2	5.5	5.6	5.8	5.5
8	5.4	6.4	6.6	6.2	5.6

(\*Includes absences or exemptions for students with disabilities, Limited English Proficiency, and medical status.)

### Statewide Graduation Percentages

The rise in academic standards was accompanied with a gradual rise in the percent of students graduating in 2000 and 2001 and a decline back to 1999 levels in 2002. The graduation percentage was derived from the number of diplomas earned in a particular year divided by the ninth grade student enrollment four years earlier. Included in the definition of diplomas are Standard Diplomas, Advanced Diplomas, Special Diplomas, and Modified Standard Diplomas. We factored out not only students who dropped out of school but also students who left high school and earned a high school equivalency diploma by taking the General Educational Development (GED) exam. We also factored out students who earned only a Program Certificate as they are students who stayed in school but did not qualify for a diploma. (Table 42)

**Table 42: Statewide Graduation Percentages\***

Year	Membership (9 <sup>th</sup> Grade)	Year	Graduates* (12 <sup>th</sup> Grade)	Percent of 9 <sup>th</sup> Graders who Graduate
1995-96	86,779	1998-99	63,875	73.6
1996-97	88,766	1999-00	65,596	73.9
1997-98	88,374	2000-01	66,067	74.8
1998-99	90,241	2001-02	66,474	73.7

(\*Includes only Stand. Dip, Adv. Dip, Spec. Dip, and Mod. Stand. Dip)

### Statewide Annual Dropout Rate

The dropout rate has remained about the same since 1999-2000 with a slight decrease in 2002. (Table 43) Since a major change was made in Virginia's dropout definition that altered the number of students who were required to be reported, there cannot be comparisons with dropout data collected prior to 1999-2000. Now, students who dropout during the school year and return to school by October 1 of the following school year are not counted as dropouts (as they were counted prior to 1999-2000).

While a graduation rate is more informative than a dropout rate, the trend in the dropout rate is important. As normally calculated, the dropout rate represents the percentage of students who leave school in a given year, not the percentage of students who eventually will dropout between ninth and 12<sup>th</sup> grades. The dropout rate captures only one year of what is usually at least a four-year span in which students leave school. As researcher, Jay Greene of the Manhattan Institute, who has long studied this issue puts it,

*Presenting dropout rates in annual terms is like reporting credit card interest rates in monthly terms: it just makes the number feel smaller.<sup>8</sup>*

<sup>8</sup> Greene, Jay. *High School Graduation Rates in the United States*. Manhattan Institute for Policy Research. November 2001.

In Virginia, the dropout rate seems small because the state calculates the dropout rate by using the total number of students in Grades 7 through 12 as the denominator rather than the number of students in just Grades 9 through 12. The annual rate would be higher and truer if the Grades 9 – 12 number was used as the denominator since many more students drop out in Grades 9, 10, 11 and 12 than at Grades 7 and 8.

**Table 43: Statewide Dropout Rate (Grades 7-12)**

1999-00	2000-01	2001-02
2.46	2.46	2.02

### **Types of Diplomas Virginia Students Are Earning**

Virginia offers several types of diplomas, including: (1) a Standard Diploma, (2) an Advanced Studies Diploma, (3) a Special Diploma for students with disabilities who complete the requirements of their IEP's, (4) an ISAE instituted in 1999-2000 for students who earn GED Certificates as part of their *Individual Student Alternative Education Plan*, and (5) a Modified Standard Diploma instituted in 2000-2001 for certain students who have a disability and are unlikely to meet the credit requirements for a Standard Diploma. Virginia also grants Program Certificates to students who complete four years of high school but do not qualify for a diploma. The number of students earning Advanced Diplomas grew by only two percent since 1997 while the number of students earning Standard Diplomas has grown by 11 percent and for the first time in six years, exceeds the number of students choosing to earn Advanced Diplomas. The number of students earning an Advanced Diploma dropped from 36,058 in 2001 to 31,991 students in 2002. From 1997 to 2002, the number of students earning Special Diplomas almost doubled; the number of students earning a Modified Standard Diploma although very small to begin with grew substantially in the last two years. The number of students earning a GED has almost tripled in Virginia since 1998. (Table 44)

**Table 44: Diplomas Statewide**

Year	Advanced Diplomas	Standard Diplomas	GED (GED/ISAE P)	Special Diplomas	Modified Standard Diploma
1996-97	31,333	29,254		878	
1997-98	32,442	29,335	698	961	
1998-99	33,482	29,329	847	1,064	
1999-00	34,958	29,386	1190	1,252	
2000-01	36,058	28,650	1920	1,322	37
2001-02	31,991	32,570	2154	1,726	216

**QUESTION: Has the percent of *Fully Accredited* and *Provisionally Accredited* (Meets State Standards) schools increased or decreased?**

What this level of inquiry tells us: One philosophy that undergirds Virginia's SOLs is that schools in danger of being publicly tagged with a *warning* or *needs improvement* rating will work hard to improve their academic performance to avoid embarrassment and a failure to gain or even lose accreditation. Schools that receive *accredited with warning* in either English or mathematics are expected to adopt an instructional model or method with a documented track record of success at raising

student achievement in reading or mathematics. They must submit to an *academic review* and file an annual report with the state detailing their progress in implementing its *School Improvement Plan*. (On the flip side, schools that are accorded *fully accredited* status are eligible to receive regulatory relief - more freedom to do things *their way* -- as long as they remain successful.)

While surveying teachers and administrators and evaluating classroom instruction is the only way to know for certain what is causing academic success, we address here whether the numbers reflect the philosophy.

**Findings:** In 2002, 1175 of Virginia's 1,829 schools eligible for accreditation are already meeting or exceeding the 2007 standard for academic achievement to specified levels in the core areas of English, mathematics, history, and science. This number has grown steadily and dramatically since its inception. Another 257 of Virginia's schools are rated *Provisionally Accredited/Meets State Standards*, meaning that student achievement at these schools either met or exceeded 2002 progress benchmarks set by the Board of Education. Almost three-quarters of elementary schools that had received *Warning* status in 1999 substantially improved their performance by earning a *Meets State Standards* or *Fully Accredited* status in 2001. (Table 45) Having said that, this review does not guarantee accordance with *No Child Left Behind*. While the spirit of SOLs and NCLB are in accord -- to have all students to a level of state-defined proficiency -- the laws use different measures. The new federal law requires that a whole variety of sub-groups of students make progress toward proficiency, which requires a school level review of sub-group data and a finer grain analysis than is possible in this study.

**Table 45: Number of Schools by Accreditation from 1999–2000 to 2002– 2003**

<b>For Year</b>	<b>Fully Accredited</b>	<b>Provisionally Accredited – Meets State Standards</b>	<b>Provisionally Accredited – Needs Improvement</b>	<b>Accredited With Warning</b>
<b>1999-00*</b>	<b>117</b>	<b>926*</b>		<b>697</b>
<b>2000-01</b>	<b>415</b>	<b>713</b>	<b>459</b>	<b>174</b>
<b>2001-02</b>	<b>735</b>	<b>557</b>	<b>398</b>	<b>95</b>
<b>2002-03</b>	<b>1180</b>	<b>254</b>	<b>310</b>	<b>85</b>

\*In 1999-00, only three levels of accreditation existed.

### **Standards of Accreditation and School Level:**

Almost half of the elementary schools were *Fully Accredited* last year. Another quarter were accredited with a *Meets State Standards* rating. While the progress is not nearly as great for middle and high schools, the great majority of schools in both levels received a *Meet State Standards* rating or better. (Tables 46, 47 and 48)

**Table 46: Elementary School Accreditation**

<b>Accreditation Status for 2001-2002</b>			
<b>Fully Accredited</b>	<b>Provisionally Accredited – Meets State Standards</b>	<b>Provisionally Accredited – Needs Improvement</b>	<b>Accredited with Warning</b>
<b>48.49%</b>	<b>25.63%</b>	<b>21.05%</b>	<b>4.83%</b>

**Table 47: Middle School Accreditation**

Accreditation Status for 2001-2002 School Year			
Fully Accredited	Provisionally Accredited – Meets State Standards	Provisionally Accredited – Needs Improvement	Accredited with Warning
28.87 %	43.30%	23.02%	4.81%

**Table 48: High School Accreditation**

Accreditation Status for 2001-2002 School Year			
Fully Accredited	Provisionally Accredited – Meets State Standards	Provisionally Accredited – Needs Improvement	Accredited with Warning
27.84%	40.21%	25.43%	6.53%

**QUESTION: In spite of the overall statewide progress on the SOLs, are there divisions that have not kept pace?**

What this level of inquiry tells us: The SOL accountability system was designed to raise the achievement of all students, in all schools, and in all school divisions in Virginia. As indicated earlier, Virginia has been remarkably successful in turning what was a *flat trend* in academic performance to one that is now characterized (statewide) by steady, positive improvements. Of most significance at this time is the high probability that school divisions that have already improved are those that have had (or developed) the capacity to respond to the challenges laid down by the SOL reforms. However, maintaining the current rate of improvement reported here will require that schools and divisions that have not yet shown progress, begin to do so. If not, the next several years' performance is likely to be less robust (and even somewhat flat) than in the recent past.

To identify the extent of progress across the state (and where *next efforts* should be focused), we identified the percent of:

- Divisions that demonstrated improvement (reduction) of at least 10 percentage points in students *not meeting* the standards in reading and mathematics from 1997-98 to 2001-02.
- Divisions that demonstrated improvement (increase) of at least 10 percentage points in students who score at the *advanced proficient* level in reading and mathematics from 1997-98 and 2001-02.

Notes: (1) Meaningful success was defined by demonstrating improvement of at least 10 percentage points from 1997-98 to 2001-02 (10 percentage points is below the average state gain of 17 percentage point but meaningful by any other measure). (2) Grade 3 was selected for the most complete analysis because if improvements were to occur as a result of the SOL-initiative, they were most likely to have occurred in the early grades where SOLs should be fully in effect. (3) The analyses do not include special programs, e.g., Schools for the Blind, State Operated Programs, or Department of Correctional Programs.

**Findings:** In reading, the vast majority of Virginia’s school divisions – around 80 percent - were able to reduce the percent of Grade 3 students in the lowest proficiency level by at least 10 percentage points and correspondingly increase the percent of students scoring *proficient or above*. (Table 49) (About 50 percent of divisions had equivalent success at both Grades 3 and 5; that percent drops to 12 percent when Grade 8 is included in the review, however.) A much smaller percentage – around 18 percent – had as much success moving Grade 3 students into the *advanced* level. Even for many schools that made huge improvements (as many as 30 or 40 percentage points in five years) in moving students out of the “*not meeting*” the standard level and into the “*proficient*” level, most made only modest increases in the percent of students who scored in the advanced level.

In mathematics, close to 84 percent of Virginia’s divisions were able to reduce the percent of Grade 3 students in the lowest proficiency level by at least 10 percentage points and correspondingly increase the percent of students scoring *proficient or above*. (Table 50) (Almost as many had equivalent success at both Grades 3 and 5 and 65 percent registered gains in Grades 3, 5, and 8 – a much higher percent than in reading.) Close to three-quarters had as much success moving Grade 3 students into the advanced level – again a much higher percent than found in reading.

Although the vast majority of Virginia’s school divisions demonstrated meaningful success in reducing the percent of students at the lowest proficiency level and increasing the percent at the *proficient* level, there are: (a) some divisions in which there were actual declines, (b) some that demonstrated no improvement, and (c) many divisions whose improvements were too modest given the number of years that were examined and the progress made elsewhere in the state. The identification of the low or slow-performing divisions can provide for two future opportunities to contribute to the pace of improvement statewide:

First, less than successful divisions can be studied to identify division-wide policies and practices that may have contributed to the lack of school success that they can change.

Second, the greatest number of individual schools in need of capacity-building can be found in the divisions with the lowest overall performance levels. There are also likely to be individual schools that were successful in these divisions that can serve as models for division-wide reform.

(See Section IV, *Next Steps*, regarding how this information may be used in the future.)

**Table 49: Grade 3 Reading**

<b>Number of Divisions demonstrating IMPROVEMENT (reduction) of at least 10 percentage points in students NOT MEETING the standard from 1997-98 to 2001-02</b>	<b>Number of Divisions demonstrating IMPROVEMENT (increase) of at least 10 percentage points in students who score at the ADVANCED LEVEL from 1997-98 to 2001-02</b>
107	23

**Table 50: Grade 3 Mathematics**

<b>Number of Divisions demonstrating IMPROVEMENT (reduction) of at least 10 percentage points in students NOT MEETING the standard from 1997- 98 to 2001-02</b>	<b>Number of Divisions demonstrating IMPROVEMENT (increase) of at least 10 percentage points in students who scored at the ADVANCED LEVEL from 1997-98 to 2001-02</b>
110	95

## Section IV

### Next Steps

#### **Sustaining and Expanding Recent Success**

The state of Virginia's effort to improve student achievement through the introduction of its four-step SOL reform process has resulted in many meaningful benefits for students in all levels of schools, all ethnic groups, in urban and rural school divisions, and in large and small schools. The state has had success, but Virginia cannot afford to rest on its laurels.

In addition to the state's own desire for continuous improvement, the federal government's *No Child Left Behind Act* requires that the state continue to show improvement in very precise ways. While not completely aligned to the new federal NCLB, many of Virginia's provisions are consistent with the spirit of NCLB, and in some cases the state's policies are producing outcomes the NCLB is designed to produce, namely, the state:

- has high quality grade-by-grade standards as a foundation for its accountability efforts;
- can report reading/language and mathematics separately;
- appears to include all schools and students in its accountability program; and, has an annual reporting program, although timeliness may be a problem.

The challenge now is how to focus Virginia's resources on those divisions and schools that need to produce specific improvements or to close gaps, within the required federally-defined sub-groups: gender, major ethnic/racial categories, socioeconomic status, LEP and special education.

One impact of Virginia's recent success is that its baseline (starting point) for NCLB will be higher than many other states. The higher baseline places pressures on Virginia to further focus and expand its efforts. There are three important steps that we recommend Virginia take to ensure that it maintains the momentum of the recent past:

Step 1: Continue to accelerate improvements in divisions and schools that have already demonstrated success.

Step 2: Build the capacity of divisions and schools that have not demonstrated success.

Step 3: Improve its capacity to monitor and report on the progress of the SOL reforms.

#### **Step 1: Continue to accelerate improvements in divisions and schools that have already demonstrated success.**

Given the fact that many divisions and schools have already shown significant academic progress in the past several years, if they continue to improve, the improvement is likely to occur at a slower – but hopefully steady – rate. The focus here will have to be on divisions and schools with any sub-groups of students who are not making the required improvement.



**Recommendation 1:** Identify those divisions that have demonstrated success as a whole but where one or more subgroups of students are underperforming or one or more schools are underperforming. In addition identify those schools that have demonstrated success as a whole but where one or more subgroups of students are underperforming.

**Step 2: Build the capacity of schools and divisions that have not demonstrated success.**

Critical to the future success of the SOL reform effort are the divisions and schools *that have not yet been successful*. Divisions and schools in Virginia have had enough time to internalize the SOL reforms, and to change or adapt their division-wide policies and instructional practices. If they had the will and/or the capacity to change on their own, they would have already done so. These divisions and schools provide Virginia with its greatest opportunity for maintaining the rate of gains that it has made in the recent past. Therefore, Virginia should consider (very quickly) sponsoring a follow-up study that would provide the following critical pieces of information:

**Recommendation 2:** In divisions that have not demonstrated success, identify division-wide policies and practices that may be hindering individual school and teacher success by *interviewing* the superintendents and senior instructional staff in some of the under-performing divisions, and *surveying* the superintendents, senior instructional staff, principals, and teachers in all under-performing divisions. Such division-wide policies and practices may include but are not limited to: (1) using curricula and/or instructional materials that are not aligned with the SOLs, (2) restricting individual school's (or staff's) use of time to assist students who are behind to catch-up, (3) offering low level curriculum and courses that do not expose students to the SOL requirements, (4) failing to require extra instructional services (e.g., Title I, computer labs, and after-school programs) to build on what is being taught in the regular classes, and (5) offering instruction to students that is not at the appropriate level of complexity needed to perform well on the SOL assessments.

**Recommendation 3:** Assess the nature and quality of prevalent teaching practices in a representative sample of schools and classrooms that have not been successful and, based on that assessment, provide the schools with a set of suggestions for practical improvements.

**Step 3: Improve the capacity to monitor and report on the progress of the SOL reforms.**

One of the ironies of this project is that in spite of all of the successes that Virginia has earned, little attention has been paid to establishing the kind of information system that is needed to appropriately report on the extent to which the reform effort is successful. It is commendable that so many state resources have gone into the design and implementation of the SOL reform process itself, now it is time for the state to build its capacity to *monitor*, *modify* and *report* on the SOL reforms as a means of extending the successes that it has recently experienced. In addition to serving its own self-interest, improving its system of collecting, analyzing and reporting data is critical in that *No Child Left Behind* requires that the state be able to report its successes and failures (over-time) for a wide range of subgroups of students.

The current state of data collection, storage and analysis in the Virginia Department of Education (as it relates to SOL reform efforts) is not as up to the task of these new demands.

**Recommendation 4:** Based on the development of this report, and the associated experiences in trying to answer some critical impact questions beyond that which is required by NCLB, we suggest that Virginia centralize its collection monitoring, and reporting of student sub-group data not only to meet the requirements of NCLB but to understand how to focus its resources. Additionally, the state will have significant difficulty meeting the annual (Fall) report card requirement without both more technical capacity and reorganized personnel. We recommend that Virginia create a centralized department or research data and analysis needs of other departments. Associated with the creation of a centralized data management office, is the need to create a single relational database that has the capacity to *assess the relationship* among a wide variety of factors (e.g. test performance, by sub-group and other indicators). The current system of handling data is too fragmented with each major program office owning its particular piece of the data pie. Currently the state Department of Education is not organized in a way in which the data required for appropriate analysis is under one roof in the Department of Education, or under the control of one person/organizational unit responsible for proper management and maintenance. Student achievement data is in one part of the department, dropout data, program participation information, and socio-economic data in other parts. Currently, if the state wants to answer questions about who benefits or fails to benefit from the SOL reform efforts, it requires special efforts to: (a) locate, collect, and synthesize data from different parts of the Department, and subsequently (b) to then create unique data files to conduct the analyses. We recommend that Virginia collect the following information:

- Disaggregate data by specific sub-groups of students: The state's interest and that generated by NCLB requires that progress be monitored by socio-economic level, ethnicity, gender, special education, Limited English Proficient (LEP), and migrant status.
- Disaggregate data by sub-test: Getting underneath total scores helps teachers and other educators target instruction and professional training to areas of relative weakness. For example, are certain areas in reading, such as vocabulary, language mechanics, or comprehension, stronger or weaker than other areas? Likewise, if students' achievement is consistently stronger in one grade than another, schools and districts have the information they need to ask why. And they have the reassurance that widespread improvement is possible.
- Advanced Proficient at high school level: As discussed in the Executive Summary of this report, we learned that Virginia doesn't regularly report its *advanced* scores separately on the *end-of-course* tests, they are reported as part of the passing scores. The failure to separate out advanced scores from passing scores could be depressing overall performance. Also, what gets measured tends to get done. In other words, if state doesn't focus on advanced performance, neither will schools nor students.
- Advanced Placement: Virginia is only reporting data on the number of students who take an Advanced Placement course and the number who score 3 or better. Data such as the percent of high school students enrolled in an Advanced Placement course and the percent of students taking Advanced

Placement course who also take at least one Advanced Placement test – disaggregated by sub-group-- are also important to report. Research shows that taking challenging courses such as Advanced Placement in high school is a better predictor of college completion than good high school grades or test scores. More complete analysis of data in this area will heighten the focus. Also, by more fully reporting Advanced Placement data, Virginia can gauge how many students are maximizing the potential in their courses and trying to gain the most from them.

- **Other Higher Level Course Enrollments:** The Southern Regional Education Board's *High Schools that Work* program maintains that giving more students access to demanding academic core curriculum is the single most powerful step schools can take to improve achievement. Since students have some choice about what high school courses they take, it would be good to monitor what percent of students are taking Geometry, Algebra II, Chemistry and higher end science classes, etc.
- **Graduation Rates:** By this we mean measuring the percent of students who enter in Grade 9 and graduate on time from Grade 12. Essentially, the calculation of a Graduation Rate gives a truer picture of students who do not complete the course of study on time than do dropout rates.
- **Chronic Teacher and Student Absenteeism:** Common sense, backed by research, shows that attendance and achievement are linked. Showing up matters; time on task counts. Traditional reporting of average daily attendance (ADA) makes absenteeism an easy indicator to overlook (e.g., an ADA rate of 93% rarely triggers alarm bells, but it translates into missing about 2.5 weeks of class time. Likewise, a student who attends public school from kindergarten through 12<sup>th</sup> grade will have a substitute teacher for the equivalent of a full year, according to *Staffing Industry Report*<sup>9</sup>. This statistic means that the quality of substitute teachers – or, put another way, the problem of teacher absenteeism – is at least one-twelfth the teacher-quality equation. Both teacher and student absenteeism directly correlate with student performance; these are valuable data to collect in order to understand *why* students perform the way they do and *how* to improve performance.
- **Teacher Quality:** For students to reach high standards, teachers need to deepen their subject knowledge, sharpen their teaching skills and stay current with developments in their fields. Here we suggest monitoring teachers' years of experience, subject matter expertise, for NCLB, certification status, and for on-going monitoring, targeted professional development.

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<sup>9</sup> "Staffing Industry Learns to Provide Substitute Teachers: Niche has Potential to Generate Over \$2 Billion in Annual Revenues," *Staffing Industry Report*. Vol.10, Issue 1, January 12, 1999.

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